YOSHIMURA, GWEN

From: YOSHIMURA, GWEN
Sent: Monday, September 16, 2013 1:19 PM
To: Andrea Polidori
Cc: Hoag, Katherine
Subject: Two outstanding forms?
Attachments: SCAQMD TSA template.docx; data management-continuous_20110621.doc

Hi Andrea,

Could you check and see if you've sent the "data management-continuous" form back to us? I can't seem to locate it. Also, if you could read pages 5-11 of the "SCAQMD TSA template" for any updates/accuracy, that'd be great.

Thanks!

-Gwen

_____
Gwen M. Yoshimura
Air Quality Analysis Office
Environmental Protection Agency, Region 9
Phone: 415.947.4134
Email: yoshimura.gwen@epa.gov

mailing address:
U.S. Environmental Protection Agency
Air Quality Analysis Office (AIR-7)
75 Hawthorne Street
San Francisco, CA 94105

From: YOSHIMURA, GWEN
Sent: Wednesday, July 31, 2013 10:34 AM
To: JLow@aqmd.gov; apolidori@aqmd.gov; 'reden@aqmd.gov'
Cc: Hoag, Katherine; Flagg, MichaelA; Plate, Mathew
Subject: Re: South Coast TSA

Hello,

As you know, Meredith is now the manager for the Air Quality Analysis Office. We are therefore working to distribute her former monitoring team staff responsibilities, one of which is the South Coast TSA. Kate Hoag and I are taking over the TSA, and Mat Plate will continue to be involved.

We wanted to check back in with you about a few things.

1. Mat Plate and I plan to come out September 24-25. If you could confirm that those dates still work for you, that'd be great. We cannot push the date much further back, as the TSA needs to be completed before the end of September.
2. Meredith sent a number of forms along with her May 29th email (see below). Because Kate and I catching up a bit, it would be helpful to get these forms back as early as possible. Please let us know if you might be able to get the forms to us by August 31st or earlier.

3. Please also send us a matrix of previous findings with the current status of corrective actions. Again, by August 31st would be great.
4. Finally, scheduling a short check-in call a few weeks before the TSA. Do any of the following times work for you:
    a. Wednesday 9/4 at 11am, 2pm, or 3pm
    b. Thursday 9/5, any hour between 9 and 4
    c. Friday 9/6, any hour between 9 and 4

Thanks much! Please let me or Kate know if you have any questions. Looking forward to seeing you all.

-Gwen

_____
Gwen M. Yoshimura
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From: Kurpius, Meredith
Sent: Wednesday, May 29, 2013 1:30 PM
To: 'Jason Low'; apolidori@aqmd.gov; 'reden@aqmd.gov'
Cc: Plate, Mathew
Subject: South Coast TSA

Rudy, Jason, and Andrea,
It has been 3 years since our last Technical System Audit (TSA). As the regulation requires, it is time for another TSA. We will be doing a scaled-back in-person audit this time. Mat Plate and I intend to spend 2 days with you, hopefully in July. Please let me know if July 23-25 will work for an on-site visit. I will arrange a teleconference a few weeks prior to the on-site visit to review the schedule and address and questions.

I will be sending a detailed agenda for your review in the next few weeks. In the meantime, there are 3 sets of information that we will need roughly two weeks prior to the on-site visit:

- The section of the previous report that describes your ambient air monitoring program – please review and revise the section called, “Overview of Air Monitoring Program” to reflect current operations. I included the rest of the TSA report template in case you would like to see the structure of the entire report. [attachment: SCAQMD TSA template.docx)
- TSA Forms – please distribute and start filling them out. Note that much of the field operations information is already in the annual network plan. There is no need to copy the field operations information to the forms – you can simply reference the annual network plan. [all other attachments]
- Matrix of previous findings with current status of corrective actions.

Mat may also want some quality system documents but he will get in touch to request those if he needs them.

Let me know if you have any questions or thoughts. Thanks!

-Meredith

Meredith Kurpius, PhD
Air Quality Analysis Office, Air Monitoring Team Lead
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75 Hawthorne St., AIR-7, San Francisco, CA 94105

Technical System Audit
South Coast Air Quality Management District
Ambient Air Monitoring Program
(date of audit)

Conducted by

Air Quality Analysis Office
Air Division

Quality Assurance Office
Management and Technical
Services Division

US EPA Region 9
75 Hawthorne Street
San Francisco, California 94105

Final Report: (date)

INDEX

GLOSSARY OF ACRONYMS

AQAO..... Air Quality Analysis Office
AQIS……Air Quality Instrument Specialist
AQS..... Air Quality System
BAM..... Beta Attenuation Monitor
CA..... California
CARB..... California Air Resources Board
CO..... Carbon Monoxide
CFR..... Code of Federal Regulations
DQO..... Data Quality Objective
EMS..... Electronic Management System
EPA..... Environmental Protection Agency
FEM..... Federal Equivalent Method
FID ..... Flame Ionization Detector
FRM..... Federal Reference Method
GC ..... Gas Chromatograph (Gas Chromatography)
ICP-MS..... Inductively Coupled Plasma- Mass Spectroscopy
IO..... Inorganic Compendium
LTE..... less than or equal to
MATES ..... Multiple Air Toxics Exposure Study
MDL ..... Method Detection Limit
MS ..... Mass Spectrometer
MSD ..... Mass Selective Detector
NAAQS.....National Ambient Air Quality Standard
NATTS.....National Air Toxics Trends Stations
NCORE.....National Core multipollutant monitoring stations
NIST ..... National Institute for Standards and Technology
NO_x/NO_y..... Nitrogen Oxides
O_3..... Ozone
ORD ..... Office of Research and Development
PAMS ..... Photochemical Assessment Monitoring Stations
Pb..... Lead
PE ..... Performance Evaluation
PM..... Particulate Matter
$PM_{2.5}$..... Particulate Matter with aerodynamic diameter LTE 2.5 µm
PM_{10}..... Particulate Matter with aerodynamic diameter LTE 10 µm
POC ..... Parameter Occurrence Code
PQAO.....Primary Quality Assurance Organization
QA.....Quality Assurance
QAPP..... Quality Assurance Project Plan
QAO.....Quality Assurance Office
QC.....Quality Control
QMP.....Quality Management Plan
RTI ..... Research Triangle Institute (EPA Contractor)

SCAQMD..... South Coast Air Quality Management District
SLAMS..... State or Local Air Monitoring Station
SOP..... Standard Operating Procedure
SO_2..... Sulfur Dioxide
SPM..... Special Purpose Monitor
SRP..... Standard Reference Photometer
STN..... Speciation Trends Network
STP..... Standard Temperature and Pressure
TAD..... Technical Assistance Document
TEOM..... Tapered Element Oscillating Microbalance
TO..... Toxic Organic Compendium
TSA..... Technical System Audit
TSP..... Total Suspended Particles
XRF..... X-ray Fluorescence

EXECUTIVE SUMMARY

This document is a report on the findings of the United States Environmental Protection Agency (EPA) made during a Technical Systems Audit (TSA) of the South Coast Air Quality Management District (SCAQMD) ambient air monitoring program. A TSA is an on-site review and inspection of a state or local ambient air monitoring program to assess its compliance with established regulations governing the collection, analysis, validation, and reporting of ambient air quality data. This TSA meets the requirements for EPA audits of the SCAQMD monitoring organization required by 40 CFR part 58, appendix A, §2.5.

The TSA was conducted by EPA Region 9 staff from [dates of audit]. The audit team interviewed management and staff on specific aspects of the air monitoring program including network design, field operations, laboratory operations, data handling, quality assurance and quality control procedures. The audit team also inspected some of the monitoring sites operated by SCAQMD. The site inspections consisted of an interview with the site operator when possible, review of station and instrument logbooks, and evaluation of the station siting with respect to EPA requirements for probe siting (40 CFR 58, Appendix E). The laboratory inspection included a review of the particulate matter (PM) program for mass determinations of PM_{10} and $PM_{2.5}$.

The TSA is one of the ways that EPA provides oversight to ensure that data collected by state, local, and tribal agencies meet required minimum data quality objectives. Other assessments, such as network reviews and performance evaluations, also provide information about the overall quality of ambient air monitoring data. These assessments enable agencies to identify and correct those program elements that may be adversely affecting the quality of ambient air data. The results of the TSA are summarized here and fully described in this report, along with recommended actions to address the findings. The specific actions to be taken by SCAQMD will be determined through negotiations between EPA and SCAQMD, and will be documented in a corrective action plan prepared by SCAQMD.

EPA would like to thank all the staff and management of SCAQMD for their assistance and cooperation during the audit.

A. Program Strengths:

B. Program Major Findings:

During the TSA, EPA identified areas where SCAQMD's monitoring program should be strengthened. The major findings are:

The individual findings are reported in the Findings section of this document and are also summarized in Appendix A.

TSA ACTIVITIES

From [date of audit], the U.S. EPA Region 9 Air Quality Analysis Office (AQAO) and the Region 9 Quality Assurance Office (QAO) conducted a Technical System Audit of SCAQMD's ambient air monitoring program. The TSA reviews one part of SCAQMD's program responsibility, the collection and analysis of ambient air quality data, which is the responsibility of the Air Quality Assessment Section. The TSA covered the following program areas:

- General / Quality Management
  - Program organization
  - Facilities
  - Independent quality assurance and quality control
  - Planning documents (including QMP, QAPPs, & SOPs)
  - General documentation policies
  - Training
  - Corrective action
  - Quality improvement
  - External performance audits
- Network Management / Field Operations
  - Network design
  - Changes to the network since the last audit
  - Proposed changes to the network
  - Field support
- Laboratory Operations
  - Routine operations
  - Quality control
  - Laboratory preventive maintenance
  - Laboratory record keeping
  - Laboratory data acquisition and handling
  - Specific pollutants: PM_{10}, $PM_{2.5}$, Toxics, PAMS, and Lead
- Data and Data Management
  - Data handling
  - Software documentation
  - Data validation and correction
  - Data processing
  - Internal reporting
  - External reporting

EPA tracked supporting documentation for data points from calendar years ____ and ___.

The EPA staff who conducted the TSA were _____ of the Region 9 Air Division's Air Quality Analysis Office and _____ of the Region 9 Quality Assurance Office conducted the TSA. In addition to the EPA Audit Team, Matthew Lakin and Eugenia McNaughton, managers of the Air Quality Analysis Office and Quality Assurance Office, respectively, participated in the opening and closing meetings.

Participating managers and supervisors of the SCAQMD Air Quality Assessment Section included _____.

This report is divided into the following sections:

- Executive Summary – describes the purpose of the TSA and a summary of the major findings.
- TSA Activities – outlines the timing of this TSA and the programs that were covered.
- Overview of Air Monitoring Program – describes the District's Air Monitoring Program.
- Findings – collection of positive, major, and minor findings that includes details associated with each finding.
- Appendix A – summarized list of findings with priority ranking.
- Appendix B – District organizational chart.

The Findings section includes positive findings along with findings that require corrective action. The findings are grouped by program area. Recommendations to resolve findings are provided for each finding that requires corrective action to give some indication of the EPA expectations as to how findings can be addressed. If the District has other approaches or alternatives to address the concerns identified, EPA will consider them, provided the corrective action adequately addresses the finding. Appendix A is a summarized list of findings and each finding, excluding positive findings, is grouped according to priority, as either highest priority, moderate priority, or all other significant findings. Higher priority findings are those that: (1) are over-arching issues, (2) have a greater impact on regulatory decisions, and/or (3) have a greater effect on data quality. Regardless of priority, all findings, excluding positive findings, need to be addressed in a corrective action report.

General

The audit team interviewed management and staff on specific aspects of the air monitoring program including network design, field operations, laboratory operations, data handling, quality assurance and quality control procedures. EPA interviewed _____ and reviewed SCAQMD's _____.

Network Management

EPA interviewed _____ and reviewed SCAQMD's _____ Annual Network plan. SCAQMD also submitted a five-year Annual Network Assessment as required by 40 CFR part 58.10. Generally, the monitoring network [meets/does not meet] the requirements for the minimum number of monitoring sites designated as SLAMS for all of the criteria pollutants.

Field Operations

In addition to _____, EPA interviewed several Air Quality Monitoring Unit staff. All staff demonstrated a thorough knowledge of the monitoring equipment for which they were responsible.

EPA visited (number of sites visited) monitoring sites (site names). All sites met the siting criteria of 40 CFR part 58, appendix E. The evaluation included inspection of the inlet manifolds, examination of station and instrument logbooks, and a check of whether appropriate QC checks and QA audits were being performed. [general comments about the sites]

Laboratory Operations

Particulate Matter Laboratory (Gravimetrics Laboratory)

EPA visited the particulate matter (gravimetric) laboratory and interviewed _____. [comments about the lab]

Toxicology Laboratory

EPA visited the toxicology laboratory and interviewed _____. [comments about the lab]

Data and Data Management

This section covers data management for criteria pollutants (O_3, CO, NO_2, SO_2, $PM_{2.5}$, and PM_{10}). Staff interviewed were [names of staff].

Quality Management

EPA interviewed [names] and reviewed quality management documents. In addition, EPA collected information about QA/QC activities during interviews of other sections of the technical system.

OVERVIEW OF AIR MONITORING PROGRAM

General Program

Federal and State of California laws require that clean air standards be met and maintained throughout the country and the State of California. Authority and responsibility for air quality monitoring has been delegated to SCAQMD by EPA pursuant to the Clean Air Act of 1977 and the Clean Air Act Amendments of 1990. The SCAQMD is defined in the California Health and Safety Code, Division 26, Air Resources, Section 40412 as the "Sole and exclusive agent having responsibility for air pollution control within the District." The State defines the geographic extent of SCAQMD as "portions of Counties of Los Angeles, Orange, Riverside, and San Bernardino included within the area of the South Coast Air Basin, as described in Section 60104 of the Title 17 of the California Administrative Code."

SCAQMD currently has 34 active monitoring stations for criteria pollutants. The pollutants measured include:

- Carbon Monoxide
- Nitrogen Dioxide
- Sulfur Dioxide
- Lead
- Ozone
- Particulate Matter (PM_{10} and $PM_{2.5}$)

The Executive Officer of SCAQMD is, Barry Wallerstein. Chung Liu, Deputy Executive Officer, heads the Science & Technology Advancement Division. The Monitoring & Analysis sub-Division is the primary organization in Science & Technology Advancement responsible for air monitoring. The Monitoring and Analysis group has three functional areas: Laboratory Services & Source Test Engineering (Rudy Eden, manager), Atmospheric Measurements (Philip Fine, manager), and Quality Assurance (Jason Low, manager).

Atmospheric Measurements (Monitoring), Laboratory Services & Source Test Engineering (Laboratory), and Quality Assurance (QA) each have a role in the collection and evaluation of ambient air data as defined by the SCAQMD Quality Management Plan (QMP). The Monitoring group is responsible for most of the ambient air data collection, including sampling and data processing of continuous air monitors. The Laboratory is responsible for preparation of sampling media, analysis of analytical samples from the non-continuous monitors, and processing of data for these samples analyzed by the laboratory. Both groups are responsible for implementing routine quality assurance and quality control (QA/QC) procedures. The QA group is responsible for tracking and oversight of training, corrective actions, and data handling. The QA group also implements performance and technical audits and coordinates and participates in the preparation of QA planning documents.

Network Management

The ambient air monitoring network in the South Coast AQMD currently consists of 34 State/Local Air Monitoring Stations (SLAMS) plus several source oriented lead monitors, special studies and Special Purpose Monitoring (SPM) sites that utilize a variety of air pollutant measuring instruments. The following table summarizes the SLAMS sites in the SCAQMD.

Table 1: SLAMS sites in the SCAQMD

Site	O_3	CO	NO_x	SO_2	FRM PM_{10}	BAM PM_{10}	TEOM PM_{10}	FRM $PM_{2.5}$	BAM $PM_{2.5}$	Pb
Anaheim	X	X	X		X		X	X	X	
Azusa	X	X	X		X			X		
Banning Airport	X		X		X					
Big Bear								X		
Burbank	X	X	X	X	X		X	X	X	
Compton (Replaced Lynwood)	X	X	X					X		X
Costa Mesa	X	X	X	X						
Crestline	X	X			X					
Fontana	X	X	X	X	X			X		
Glendora	X	X	X				X			
Indio	X				X	X		X, X		
La Habra	X	X	X							
LA-Main St	X	X	X	X	X	X		X, X		X
Lake Elsinor	X	X	X				X			
LAX Hastings	X	X	X	X	X					X
Long Beach - North	X	X	X	X	X		X	X	X	X
Mira Loma - Van Buren (replacing Jurupa)	X	X	X		X			X	X	
Mission Viejo	X	X			X			X		
Norco					X					
Ontario Fire Station					X			X		
Palm Springs	X	X	X		X	X		X		
Pasadena	X	X	X					X		
Perris	X				X					
Pico Rivera #2	X	X	X					X		X
Pomona	X	X	X							
Redlands	X				X					
Reseda	X	X	X					X		
Riverside		X	X					X		X
Rubidoux	X	X	X	X	X		X	X, X	X	X
San Bernadino	X	X	X		X		X	X		X
Santa Clarita	X	X	X		X					
South Long Beach					X			X		X
Upland	X	X	X				X			X
West LA	X	X	X							

Source: SCAQMD 2009 Air Monitoring Network Plan

SCAQMD also operates the following special purpose monitoring sites (SPM) and source-oriented lead sites:

- Port study sites at the Ports of Los Angeles and Long Beach
- Pb at Exide: Rehrig in Vernon, and ATSF in City of Commerce
- Pb at Quemetco (Closet World) in City of Industry
- Pb at Trojan Battery (Uddelholm) in Santa Fe Springs
- Pb at Van Nuys Airport

In addition, the District operates a network of air toxics stations, including a National Air Toxics Trends Stations (NATTS) at the Los Angeles (Main) and Rubidoux sites. This audit addressed air toxics activities that support the NATTS, including both field and laboratory operations. These two sites are also designated as National Core (NCore) multipollutant monitoring sites.

The District operates a network of Photochemical Assessment Monitoring Stations (PAMS). The PAMS network consists of seven sites. LAX/Hastings is a Type 1 (upwind, background, and transport) PAMS site; Azusa, Burbank, Los Angeles (Main), and Pico Rivera are Type 2 (maximum precursor emission/central business district) sites; Rubidoux and Santa Clarita are Type 3 (maximum ozone concentration) sites. EPA has approved the District's PAMS network, operating schedule and forecasting scheme.

Field Operations

Field operations are performed by the Atmospheric Measurements Division, which is managed by Philip Fine. This division is divided into two groups: Ambient Monitoring and Special Monitoring. Routine ambient monitoring is conducted by the Ambient Monitoring Group. The Special Monitoring Group undertakes special projects and seasonal monitoring as needed. The Ambient Monitoring group is subdivided into Operations, Support, and Data Management sections. Day-to-day monitoring station operations are performed by the Operations section, which is broken into sub-sections. Each sub-section has at least one Senior Air Quality Instrument Specialist (AQIS) and five AQISs. Repairs and calibrations are performed by the AQISs in the Support section.

Laboratory Operations

Analytical laboratories provide support for measurement methods that are either too complex or too sensitive to perform in the field environment. In order to provide these services, laboratories employ advanced instrumentation and staff with highly specialized training.

For ambient air samples to provide useful information or evidence, laboratory analyses must meet the following basic requirements:

1. The laboratory must maintain a suitable facility for sample receipt, storage, analysis, and reduction and storage of data.
2. The laboratory must have sufficient and appropriate equipment that must be calibrated and maintained frequently.
3. The laboratory must have an adequate number of qualified staff.

4. Analytical procedures must be in accordance with official guidance, EPA methods and accepted practice.
5. Complete and accurate records must be kept.

SCAQMD has a clean, modern, expansive laboratory facility located at the headquarters office in Diamond Bar, California. The laboratory supports many chemical analyses necessary to understand a large complex air basin and its diverse source mix. One of the primary responsibilities of the laboratory is the handling of PM filters, which includes preparation, weighing, tracking and storing $PM_{2.5}$, PM_{10} and total suspended particle (TSP) filters. In addition to PM responsibilities, the laboratory is also responsible for sample analyses of Speciation Trends Network (STN), PAMS, NATTS and special projects run by SCAQMD, such as the Multiple Air Toxics Exposure Study (MATES) series. The compounds SCAQMD routinely analyzes for include:

- VOCs for PAMS (TO-14)
- VOCs for NATTS (TO-15)
- Carbonyls for PAMS and NATTS (Toxic Organic Compendium [TO]-11A)
- $PM_{2.5}$ metals for STN by X-ray Fluorescence (XRF) (Inorganic Compendium [IO]-3.3)
- PM_{10} metals for NATTS by Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS) (IO-3.5)
- Pb-TSP by XRF
- Acrolein for NATTS (modified TO-15)
- Hexavalent chrome for NATTS by ion chromatography (modified California Air Resources Board (CARB) method)
- Anions for STN

There are a number of additional activities the laboratory undertakes to support the collection and analysis of air pollutants. These include canister cleaning and preparation, data validation and sample storage.

Particulate Matter Laboratory (Gravimetric Laboratory)

[Describe PM lab here.]

Toxicology Laboratory
[Describe toxics lab here.]

Data and Data Management

Data management includes data collection, the data validation process, and a data management system. Data management at the District follows two separate tracks: one for continuous (i.e., non-laboratory) data and one for laboratory data.

SCAQMD has defined procedures for handling data from the time of acquisition to the time that it is submitted to EPA. The procedures are well known to the principal data providers and reviewers. Responsibility for managing ambient monitoring data is divided between the

Atmospheric Measurements Branch operators, data validators, and Senior and Principal Air Quality Instrument Specialists (AQIS).

The Quality Assurance Manager reports results of QA audits and evaluations to a Quality Assurance Alert Log, AQS Event Flag Summary, and Corrective Action Request Log. These reports are incorporated into the review processes of Atmospheric Measurements and the Laboratory.

SCAQMD has four separate data management and validation processes in place for different data streams reported to AQS. Continuous monitoring data is handled by Atmospheric Measurements. The laboratory has three separate data streams: 1) filter-based $PM_{2.5}$; 2) filter-based PM_{10}, TSP, Pb, and non-NAAQS metals; and 3) organic analyses.

Continuous Monitoring for Gaseous Pollutants and Particulates

Air quality data measured by the continuous analyzers at the field stations are stored in SCAQMD data loggers and station computers. Each station is polled minute-by-minute and the data are transmitted directly to the District's central computer. Electronic chart recorders (Eurotherm Chessels) located at each station serve as a back-up system and provide a supplemental record for the data validation. Data may also be transferred manually using various devices, including laptop computers and flash drives.

SCAQMD performs four levels of validation for continuous data. The station data loggers and the FORTRAN-based data system perform automated checks. Field Operation staff review data and recommend flags. Data validators review quality control parameters. Data validators then evaluate data in relation to concurrent, corresponding data sets.

Laboratory Data Systems: Filter-Based $PM_{2.5}$ Particulate Monitoring; Monitoring of Lead and non-NAAQS Metals; and Monitoring of Organic Compounds

$PM_{2.5}$ filters are prepared and pre-weighed by the filter laboratory and transferred to the field technicians. The laboratory also prepares other sampling media (canisters, filters, and sorbents) to be collected by the field technicians, with the exception of PAMS auto GCs, which are operated in the field by the laboratory staff. The field group performs a review of the field handling, sampler performance, and other field collection information. When filters are processed at the laboratory, the filter laboratory staff performs a review of the field operational parameters, including electronic records produced by the samplers. The laboratory reviews the Quality Assurance Alert Log, AQS Event Flag Summary, and Corrective Action request log for items specific to the data being processed. Data is appropriately flagged or invalidated and a Senior Laboratory Chemist performs the final levels of data review prior to uploading data to AQS.

Quality Management

Quality management is the system put in place to oversee quality assurance, quality control and quality improvement activities. EPA requires that ambient air monitoring agencies have a quality

management system that conforms to 40 CFR part 50 Appendix A and EPA's quality policy (EPA Order CIO 2105.0). Additionally, EPA grant regulations specifically require each grantee to provide for QA activities (40 CFR part 31.45). Specifically, 40 CFR part 50 Appendix A, §3 requires that each ambient air monitoring Primary Quality Assurance Organization (PQAO) conform to certain quality management practices. These include:

- A documented quality system in place that meets EPA requirements for QMPs and QAPPs.
- A quality management function that is independent of air monitoring operations.
- Defined Data Quality Objectives (DQOs), or equivalent systematic planning procedures, for all monitoring programs.
- Participation in National Performance Evaluation Programs, which consist of performance audits used to independently determine program adequacy, national monitoring network performance, and national consistency.
- Participation in Technical Systems Audits by EPA at a frequency of at least once every three years.
- Use of certified reference materials to standardize monitoring equipment.

EPA views the application of these quality management system components as integral to monitoring programs. Insufficient quality management and control may undermine the ability of EPA to make NAAQS designation decisions.

SCAQMD has a defined quality management system, which includes a quality management plan and oversight by an independent quality assurance manager and audit program.

SCAQMD has a QA group led by a QA Manager, Jason Low, having organizational parity with the Ambient Monitoring and Laboratory Managers. There are two direct reports to the QA Manager, a QA auditor and a QA Chemist. The QA group also manages a support contract that performs additional QA/QC audits of the monitoring network.

EPA regulations require independent performance audits of gaseous pollutants and flow audits of $PM_{2.5,}$ and PM_{10} and monitors. For gaseous pollutants, the current regulation requires that 25% of each pollutant monitoring network be audited per calendar quarter so that each instrument is audited once per year. Prior to 2007, flow audits of these monitors were also required. Additionally, quarterly independent flow audits of $PM_{2.5}$ samplers were required. Beginning in calendar year 2007, semi-annual flow audits of each $PM_{2.5}$, PM_{10}, and TSP sampler are required (40 CFR, Part 58, Appendix A, Sections 3.2.4 and 3.3.3.) This is in addition to the required monthly flow evaluations (40 CFR, Part 58, Appendix A, Sections 3.2.3 and 3.3.2.).

The Quality Assurance group is responsible for conducting the required gaseous pollutant audits and PM_{10} and $PM_{2.5}$ flow audits. An independent contractor supports the flow audits of filter-based samplers and provides audit results to site operators. A contractor also supports meteorological audits.

FINDINGS

Program Area	Finding Numbers	EPA Contact
General		
Network Management		
Field Operations		
Laboratory Operations Gravimetric Laboratory		
Laboratory Operations Toxicology Laboratory		
Data and Data Management		
Quality Management		

Finding #	1
Agency:	SCAQMD
Date of Audit:	
Program Area:	
Finding:	
Discussion:	
References:	
Recommendation to Address Finding:	

APPENDIX A: SUMMARY OF FINDINGS

FINDINGS

Finding 1:

APPENDIX B: ORGANIZATIONAL CHARTS

DATA AND DATA MANAGEMENT
For Continuous Analyzers

State/Local/Tribal Agency Audited:

Auditor / Agency:

Key Individuals

Data Manager:

Data Supervisor:

Data Validator(s):

Quality Assurance Manager:

Overview of Data Flow

Question	Yes	No	Comment
Is there a procedure, description, or a chart which shows a complete data sequence from point of acquisition to point of submission of data to EPA? If yes, please attach. If no, please include one in the space below.			
Data flow diagram:			
Are procedures for data handling (e.g., data transfer, storage, etc.) documented? If yes, list documentation in comments.			If yes, indicate document where such criteria can be found (title, revision date).

Raw Data

Question	Yes	No	Comment
What is the data processing location for data received from the field? Office/Lab: Computer/server:			
In what media (e.g., diskette, data cartridge, or telemetry) and formats do data arrive at the data processing location? Please list below.			

Category of Data (by Pollutant)	Data Media and Formats

How often are data received at the data processing location from the field sites?			
How are data entered to the computer/server at the data processing location (e.g., computerized transcription (copy from disk or data transfer device), manual entry, digitization of strip charts, or other)?			

Question	Yes	No	Comment
For manual data, is a double-key entry system used?			
Once uploaded to the data processing center: What database(s) is/are data uploaded into for storage? What is the format of data in the database? What database(s) is/are used to view and/or edit data?			
What dataset is considered the raw dataset, representing data from the field before it is edited? How are these data protected? Who has access to the raw data? How is access by others prevented?			
How is the raw dataset backed up? How often is the raw dataset backed up?			
Are raw data submitted to other databases such as AirNow or state databases? If yes, list in comments.			

Data Validation

Question	Yes	No	Comment
Has your agency established and documented the validation criteria?			If yes, indicate document where such criteria can be found (title, revision date).
Does documentation exist on the identification and applicability of flags (i.e., identification of suspect values) within the data as recorded with the data in the computer files? If yes, who are these flagging documents available to? (please check all that apply) ☐ Field operators ☐ Data validator(s) ☐ Data supervisor ☐ Data manager			
Does your agency document the data validation criteria including limits for values such as flow rates, calibration results, or range tests for ambient measurements? If yes, who are these validation criteria documents available to? (please check all that apply) ☐ Field operators ☐ Data validator(s)			

Question	Yes	No	Comment
☐ Data supervisor ☐ Data manager			
Review by Field Operators: Do field operators review any data?			If yes, indicate which data.
How are data issues from the field operators communicated to the data validator(s)? When is this done? What information is included?			
First Level Data Validation (i.e., done by validator(s) at data processing location): When does the first level of data validation occur (e.g., daily, weekly, monthly)? By whom? Describe the process of this data review: What action is taken by the data validator if he/she finds data that does not meet data validation criteria (e.g., data flagged, modified, deleted, etc.)?			
Second Level Data Validation: When does the second level of data validation occur (e.g., daily, weekly, monthly)? By whom? Describe the process of this data review: What action is taken by the reviewer if he/she finds data that does not meet data validation criteria (e.g., data flagged, modified, deleted, etc.)?			
Third Level Data Validation: Does a third level of data validation occur? If so, when? By whom? Describe the process of this data review: What action is taken by the reviewer if he/she finds data that does not meet data validation criteria (e.g., data flagged, modified, deleted, etc.)?			
Additional Data Review: Describe any additional data review that occurs.			

Question	Yes	No	Comment
What criteria are used to determine that a data point be deleted*?* Discuss briefly.			
What criteria are used to determine if data need to be reprocessed? Discuss.			

Data Correction and Submittal

Question	Yes	No	Comment
At what stage(s) in the data review process are changes to the database implemented? By whom? Where is the basis for the data changes recorded? Who has final approval authority for changes? Is the raw dataset overwritten or is a new dataset generated? If the raw dataset is overwritten, describe where the original dataset is archived.			
Are data submitted to AirNow?			
If yes, when are data submitted to AirNow?			
When are data routinely submitted to AQS?			
Please describe how changes made to data that were submitted to AQS and AirNow are documented.			
Who has signature authority for approving corrections to AQS and AirNow?			
Are corrected data resubmitted to the issuing group for cross-checking prior to release?			
Does your agency have information on the reporting of precision and accuracy data available?			
Are data precision and accuracy checked each time they are			

Question	Yes	No	Comment
calculated, recorded, or transcribed to ensure that incorrect values are not submitted to EPA?			
Data Certification: Are data certified?			
Who prepares the data certification package? Who reviews the data certification package? Who signs the data certification package? What data are included (e.g., SLAMS, SPM, Toxics, etc.)?			

Data Backup

Question	Yes	No	Comment
List points at which data are backed up and method of backup:			
What is the recovery capability in the event of a significant computer problem (i.e., how much time and data would be lost)?			
Has any significant loss of data occurred within the past three years due to data management issues? If yes, please describe in comments.			

Software

Question	Yes	No	Comment
Does your agency use an AQS Manual?			If yes, list the title, version number, and date published.
Does your agency use an AirNow Manual?			If yes, list the title, version number, and date published.
What are the origins of the software used to prepare air monitoring data for release into the AQS and AirNow database? Please list the documentation for the software currently in use for data processing, including the names of the software packages, vendor or author, revision numbers, and the revision dates of the software.			

Question	Yes	No	Comment
Has your agency tested the data processing software to ensure its performance of the intended function are consistent with the QA Handbook, Volume II, and Section 14.0?			
Does your agency document software tests?			
If yes, provide the documentation			

Record-keeping and Data Audits

Question	Yes	No	Comment
Are records kept for at least 3 years by the agency in an orderly, accessible form?			
If yes, does this include: ☐raw data, ☐calculation, ☐QC data, and ☐reports? If no, please comment:			
Are audits on data reduction procedure performed on a routine basis?			
If yes, at what frequency?			

Data Reports

Question	Yes	No	Comment
Does the agency generate data summary reports?			
If yes, please list up to three reports routinely generated, including the information requested below.			

Report Title	Distribution	Period Covered

Does your agency generate internal reports as a result of the *audits* required under 40 CFR 58, Appendix A?			
If yes, please list up to three reports routinely generated, including the information requested below.			

Report Title	Frequency

Does your agency generate internal reports as a result of the *precision checks* required under 40 CFR 58, Appendix A?			
If yes, please list up to three reports routinely generated, including the information requested below.			

Report Title	Frequency

Do either the audit or precision check reports indicated include a discussion of corrective actions initiated based on audit or			

Question	Yes	No	Comment
precision check results?			

Data Reporting

For the current calendar year or portion thereof which ended at least 90 calendar days prior to the receipt of this questionnaire, please provide the following percentages for required data submitted on time.

Period covered:_____

Percent Submitted on Time*

Monitoring Qtr.	SO_2	CO	O_3	NO_2	PM_{10}	$PM_{2.5}$	Pb
1 (Jan 1 - March 31)							
2 (Apr 1 - June 30)							
3 (July 1 - Sept. 30)							
4 (Oct.1 - Dec. 31)							

*"On time" = within 90 calendar days after the end of the quarter in which the data were collected.

For the same period, what fraction of the stations (by pollutant) reported less than 75% of the data (adjusted for seasonal monitoring and site start-ups and terminations)?

Period covered:_____

Percent of Stations ≤75% Data Recovery

Monitoring Qtr.	SO_2	CO	O_3	NO_2	PM_{10}	$PM_{2.5}$	Pb
1 (Jan 1 - March 31)							
2 (Apr 1 - June 30)							
3 (July 1 - Sept. 30)							
4 (Oct.1 - Dec. 31)							